OCT 4 1990

FLOOD INSURANCE STUDY

CITY OF SPRINGDALE, OHIO

HAMILTON COUNTY

DECEMBER 5, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER 390877

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY

CITY OF SPRINGDALE,
HAMILTON COUNTY,
OHIO

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the City of Springdale, Hamilton County, Ohio, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the U.S. Army Corps of Engineers (COE), Louisville District (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-87-E-2509, Project Order No. 14. This study was completed in July 1988.

1.3 Coordination

On , the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Springdale, Hamilton County, Ohio. The area of study is shown on the Vicinity Map (Figure 1).

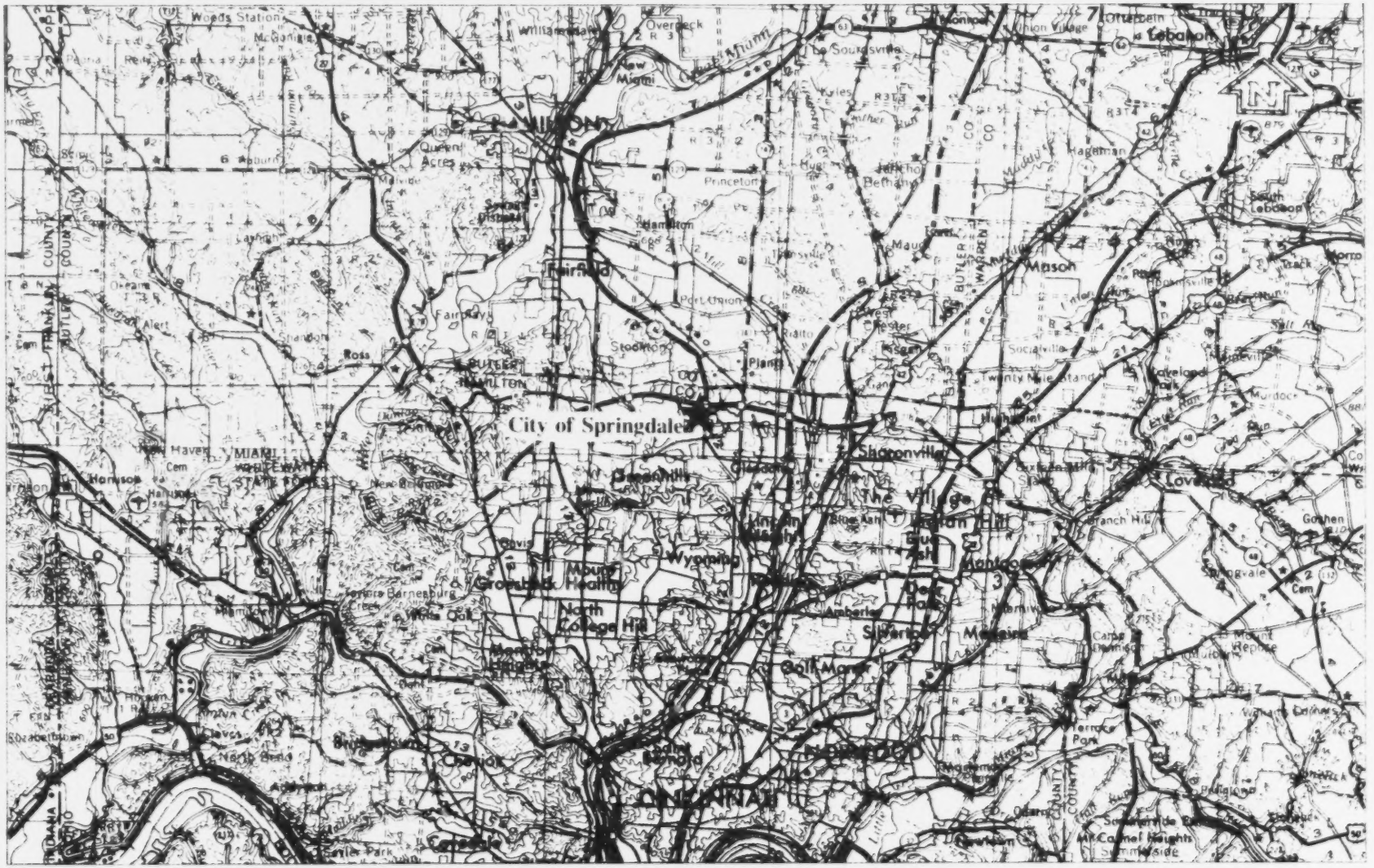


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SPRINGDALE, OH

(HAMILTON CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

Flooding caused by overflow of Springdale Tributary and Northland Road Tributary was studied in detail.

Areas having low development potential or minimal flood hazards were previously studied using approximate analyses. The results were shown on the Flood Hazard Boundary Map for the City of Springdale (Reference 1) and are incorporated into this Flood Insurance Study.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through July 1993. The scope and methods of study were proposed to and agreed upon by FEMA and the City of Springdale.

2.2 Community Description

The City of Springdale is about twelve miles north of Cincinnati, in Hamilton County, Ohio. It is bordered by Butler County and the City of Fairfield on the north, the City of Sharonville on the east, the Village of Glendale on the south, and the City of Forest Park on the west. The City of Springdale is served by State Routes 4, 126, and 747, Interstate 275, and the CSX railroad. The 1980 population was reported to be 10,111 (Reference 2).

The climate of Springdale is humid continental, characterized by large annual, daily, and day-to-day variations in temperature. Summers are moderately warm and humid with an average temperature of 90 degrees Fahrenheit. Winters are reasonably cold and cloudy with an average of only one day with sub-zero temperatures. The mean annual precipitation is 38.33 inches, with fall being the driest season. Showers and thundershowers account for most of the rainfall during the growing season. Thundershowers occur on about 45 days during the year and occur most frequently between April and August. The average annual snowfall is 16.9 inches (Reference 3).

2.3 Principal Flood Problems

Flood hazards in the City of Springdale are due primarily to overflow of Springdale Tributary, a tributary to Mill Creek. The most severe storm of recent record occured on July 1, 1985. No gage stations are located within the city, so recorded discharges are not available, but high-water marks from this event were obtained.

2.4 Flood Protection Measures

The City of Springdale recently enacted a water management ordinance to control any increase in runoff due to in-basin development. Since the July 1985 storm, a retention basin has been constructed on Northland Road Tributary just upstream of State Route 4 south of Northland Road. These measures do not protect the City of Springdale from extreme events such as the 100-year flood. However, these measures reduce the 100-year flow to 300 cfs, the capacity of the Northland Road culvert, thereby containing the

flow within the culvert system. No other flood protection measures are known to exist within the study area.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40-percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60-percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

There are no precipitation gages located within the study area. The nearest recording gage is located at West Fork Mill Creek Dam, a flood control dam operated by the COE. A total of 5.12 inches of rain fell between 6 p.m. and 8:30 p.m. on July 1, 1985, at this gaging location. According to the National Weather Service's Technical Paper 40, a 100-year storm for the same duration would produce 3.36 inches of precipitation (Reference 3). Reporting precipitation stations in the Mill Creek basin area included Hamilton-Fairfield, with 1.01 inches; Cheviot, with 1.97 inches; and Hamilton, with 2.35 inches for the 24-hour period ending July 2.

High-water mark elevation data were gathered by the City of Springdale following the storm. Using the high-water elevations at culverts, peak storm discharges were calculated using nomographs (Reference 4).

Peak discharges for the 10-, 25-, 50-, and 100-year flow frequencies were calculated at the same locations within the Springdale basin as were peak July 1985 storm discharges. The flow-frequency discharges were calculated using U.S. Geological Survey Report 86-4197 (Reference 5). The range of discharge frequencies were used to test the sensitivity of resultant profiles together with the high-water mark information in the determination of the final 100-year profile.

Standard errors of regression and prediction for the peak discharge equations range from ± 37 percent to ± 41 percent.

Peak discharge-drainage area relationships for the 10-, 50-, and 100-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 10-YEAR	50-YEAR	100-YEAR
SPRINGDALE TRIBUTARY				
at Chesterdale Road	4.47	1,700	2,400	2,640
at Interstate 275	3.44	1,500	2,130	2,340
at Princeton Road	3.36	1,470	2,100	2,310
at Neuss Avenue	2.39	1,210	1,700	1,880
at Springfield Road	1.40	840	1,180	1,290
at Cloverdale Avenue	0.60	470	620	760
NORTHLAND ROAD TRIBUTARY				
at West Kemper Road	0.67	510	660	800
at Northland Road	0.34	N/A	N/A	300

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

100-year elevations were obtained using slope-area computations determined from field-measured stream cross sections and culvert headwater computations using design nomographs (Reference 4).

Flood profiles were drawn showing the computed water-surface elevations for floods of the 100-year recurrence interval.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance

Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 10 feet (Reference 6).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary was delineated using the Flood Hazard Boundary Map for the City of Springdale (Reference 1).

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause more than a 1.0-foot increase in the base flood elevations at any point within the community.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

Flood Insurance Studies published for the Cities of Sharonville and Fairfield and Butler and Hamilton Counties (References 7-10) agree with this study.

This Flood Insurance Study supersedes the previously printed Flood Hazard Boundary Map for the City of Springdale (Reference 1).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 175 West Jackson Boulevard, 4th Floor, Chicago, Illinois 60604-2698.

9.0 REFERENCES AND BIBLIOGRAPHY

1. Federal Emergency Management Agency, Flood Hazard Boundary Map, City of Springdale, Hamilton County, Ohio, August 1981.

2. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Ohio, Washington, D.C., February 1982.

3. U.S. Department of Commerce, National Weather Service, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, Washington, D.C., January 1967.

4. Bureau of Public Roads, Engineering Circular No. 10, Capacity Change for Hydraulic Design for Highway Culverts, Washington, D.C., 1965.

5. U.S. Geological Survey, Water Resources Investigations Report 86-4197, Estimating Peak Discharges, Flood Volumes, and Hydrograph Shapes of Small Ungaged Urban Streams in Ohio, James M. Sherwood, March 1986.

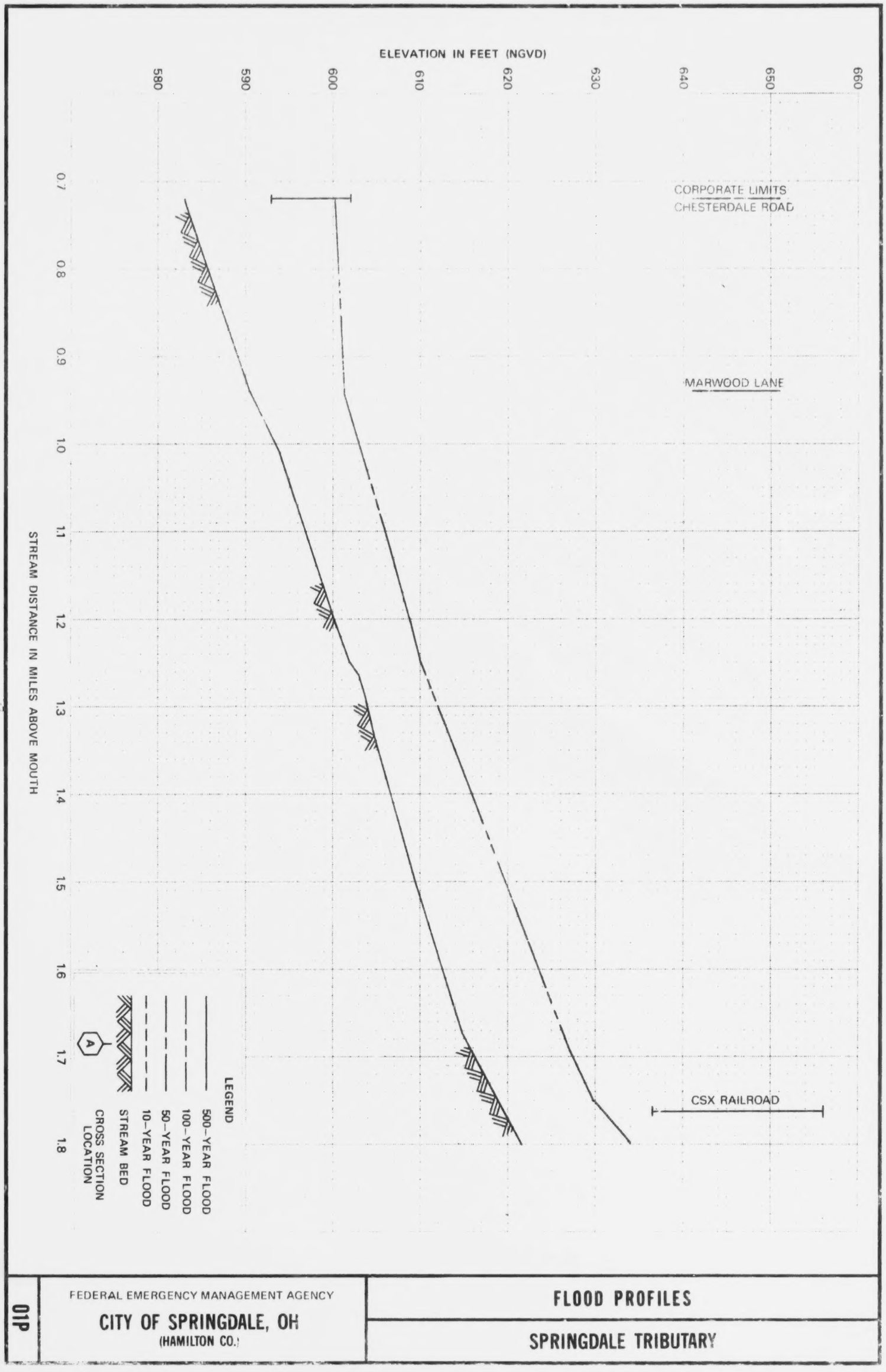
6. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 10 Feet: Greenhills, Ohio, 1965, photorevised 1981; Glendale, Ohio, 1965, photorevised 1982.

7. Federal Emergency Management Agency, Flood Insurance Study, City of Sharonville, Hamilton County, Ohio, January 1987.

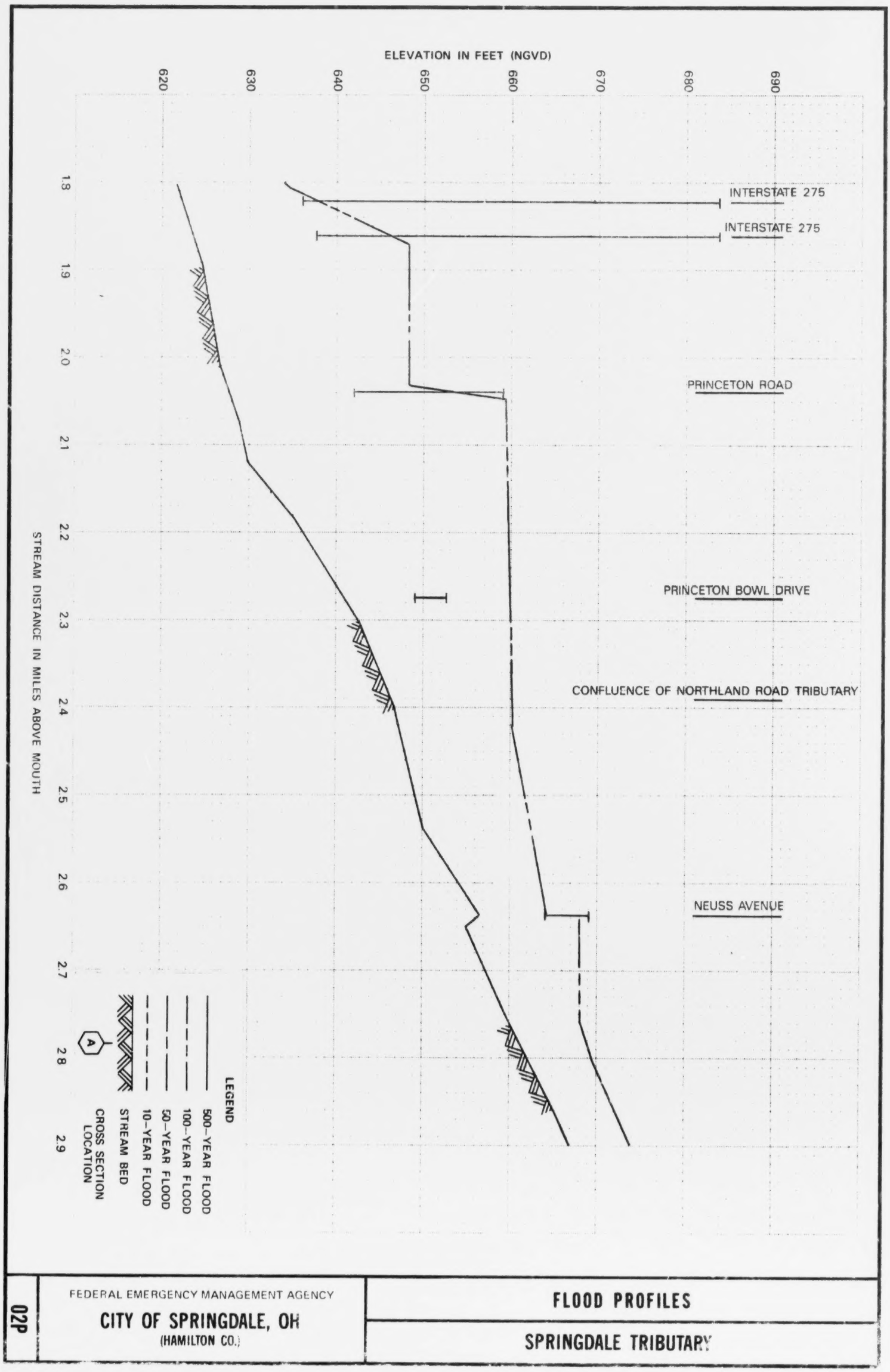
8. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Fairfield, Butler County, Ohio, March 1979.

9. Federal Emergency Management Agency, Flood Insurance Study, Butler County, Unincorporated Areas, Ohio, November 1983.

10. ————, Flood Insurance Study, Hamilton County, Unincorporated Areas, Ohio, June 1982.



01P	FEDERAL EMERGENCY MANAGEMENT AGENCY **CITY OF SPRINGDALE, OH** (HAMILTON CO.)	**FLOOD PROFILES** **SPRINGDALE TRIBUTARY**



02P

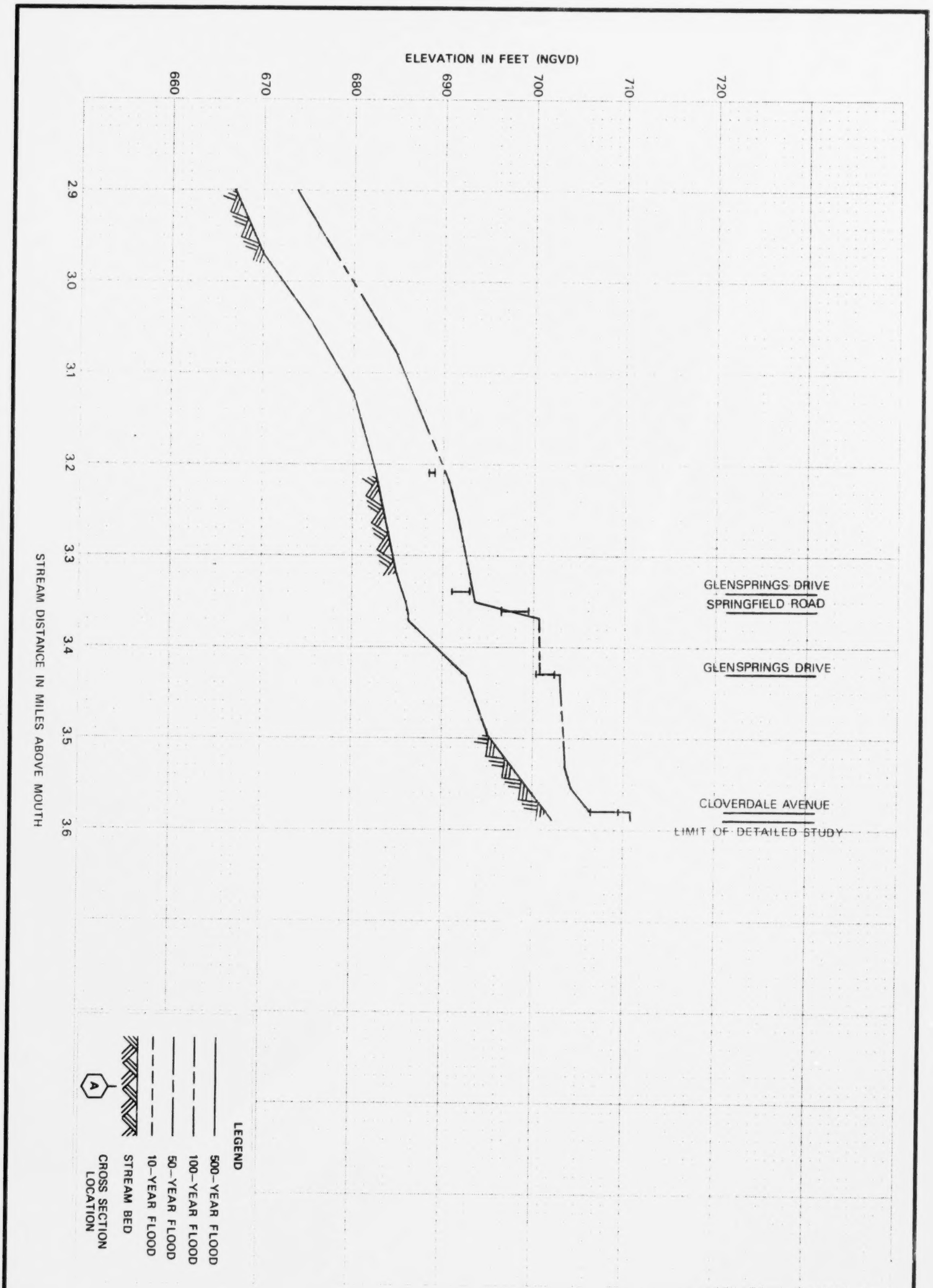
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SPRINGDALE, OH

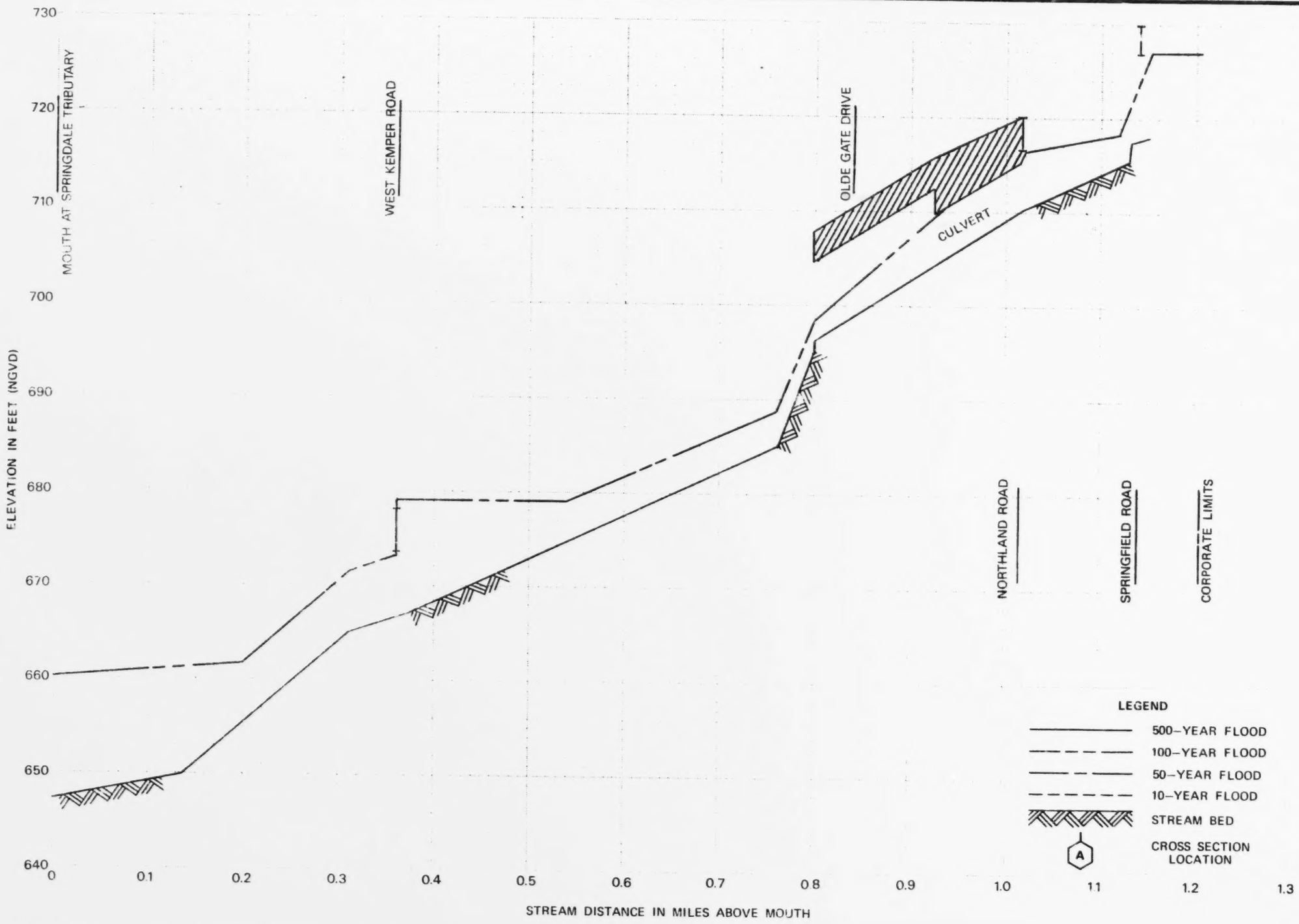
(HAMILTON CO.)

FLOOD PROFILES

SPRINGDALE TRIBUTARY



03P	FEDERAL EMERGENCY MANAGEMENT AGENCY CITY OF SPRINGDALE, OH (HAMILTON CO.)	FLOOD PROFILES SPRINGDALE TRIBUTARY



FLOOD PROFILES

NORTHLAND ROAD TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SPRINGDALE, OH.

(HAMILTON CO.)

04P